REMARKS

This is responsive to the Office Action dated February 9, 2005. A response is due on or before May 9, 2005. Since this response is being filed on or before the three month due date, no extension of time is necessary.

Claims 1 through 10 are pending in the application. Claims 1 through 10 have been cancelled in response to the Office Action. Claims 11 through 20 have been added. Support for new claims 11 through 20 exists in the specification as filed. Accordingly, entry of new claims 11 through 20 is respectfully requested. Upon entry of this amendment, claims 11 through 20 will be pending in the present application.

The subject matter of claims 11 through 20 correspond substantially to cancelled claims 1 through 10. In particular, claim 11 is substantially a combination of cancelled claims 1 and 6. As such, the rejections made against claims 1 through 10 in the Office Action dated February 9, 2005 will be addressed in relation to new claims 11 through 20.

The present invention is directed to a process for controlling the strain hardening properties of a polymer. The process of the present invention includes blending a polymer with nanoparticles to produce a polymer composition, and then forming a film from the polymeric composition. The film formed from the polymeric composition is then subjected to strain hardening. As specified in the claims, the present invention permits a reduction in the true strain at which a polymeric composition undergoes strain hardening. In particular, the presence of nanoparticles in a polymeric composition, in accordance with the present invention, yields a reduction in the true strain at which the polymeric composition undergoes strain hardening.

Claims 11, 16, 17 and 18 (new claim numbers) have been objected to based on informalities pointed out by the Examiner. Specifically, the Examiner contends that the use of volume percentages in relation to the amount of nanoparticles present in the polymeric composition of the present invention is vague and does not lend itself to repeatability by those of ordinary skill in the art.

In response, the Examiner's attention is drawn to the fact that those of ordinary skill in the art would clearly recognize how to determine the amount of nanoparticles present in the polymeric compositions recited in claims 11, 16, 17 and 18 from the term "percentage by volume". Given the clear meaning of the term "percentage by volume," one of ordinary skill in the art would recognize that one needs only determine what volume of polymer is to be used to form the polymeric compositions of claims 11, 16, 17 and 18. Once the amount of polymer has been determined, the amount of nanoparticles to be added thereto is obtained by a simple

percentage calculation. For example, in a 10% by volume polymeric composition, based on 5 liters of polymer material being present, the amount of nanoparticles needed to form the claimed polymeric composition would be 500 mL. Given that the term "percentage by volume" is self-explanatory, one of ordinary skill in the art would readily understand how to determine the amount of nanoparticles needed to form the polymeric compositions recited in pending claims 11, 16, 17 and 18.

In view of the above, the objection to claims 11, 16, 17 and 18 is believed to be unwarranted and withdrawal of the objection is respectfully requested.

Claims 11 through 15, 19 and 20 (new claim numbers) have been rejected under 35 U.S.C. §102(a) as being anticipated by U.S. Patent No. 6,407,155 to Qian et al. Claims 11 through 14, 19 and 20 (new claim numbers) have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,903,234 to Ikeda et al. Claims 11, 16, 17 and 18 (new claim numbers) have been rejected under 35 U.S.C. §103(a) as unpatentable over Qian et al.

Qian et al. is directed to methods for producing intercalated layered materials that are produced via the reaction of a layered material (e.g., a layered silicate material) with a coupling agent and co-intercalated with an onium ion spacing/compatibilizing agent and a melt processible oligomer or polymer by melt compounding. As discussed in Qian et al. at column 5, lines 14 through 18, the addition of nanoparticles to a layered material enhances the tensile, dimensional stability, ductility, gas-impermeability and elongation properties of a polymer matrix. The Examiner points to Figure 1 of Qian et al. as evidence that Qian et al. suggests and/or teaches a process for controlling the strain hardening properties of a polymer via the incorporation of nanoparticles in the polymer. Applicants respectfully disagree.

Based upon the definition of strain hardening included in Applicants' specification (see page 6, lines 12 through 13), the disclosure contained in Figure 1 of Qian et al. does not support the conclusion that the polymer compositions disclosed in relation to Figure 1 of Qian et al. have undergone strain hardening. This is because there is no sudden upturn in the true stress-true strain curves shown in Figure 1 of Qian et al. Instead, all three curves are substantially linear until they reach their peak values.

Accordingly, one of ordinary skill in the art would not recognize Qian et al. as suggesting or teaching a process to control the strain hardening properties of a polymer composition via the inclusion of nanoparticles. This is especially true in view of Example 8 of Qian et al. (column 24, lines 44 through 63), which unexpectedly yields a more ductile Nylon-6/nanoparticle composition when compared to pure Nylon-6.

Given that Qian et al. fail to suggest or teach the process of the present invention, the amount of nanoparticles used by Qian et al. is of no consequence to the present invention. Accordingly, Qian et al. fail to anticipate or render obvious the present invention as recited in claims 11 through 20.

Ikeda et al. is directed towards a process for preparing a thermoplastic film that has improved elongation and oxygen permeability, as well as controllable surface rupturing (to improve ink-receptiveness). The process of Ikeda et al. includes the steps of adding inert organic filler to a polymer composition and then biaxially stretching a polymer film made from the resulting mixture of polymer and inert organic filler. As disclosed in Ikeda et al., the inert inorganic filler has an average particle size of 0.3 to 8 microns. Ikeda et al. fail to teach or suggest a method for controlling the stain hardening of a polymeric composition.

Notwithstanding this failure by Ikeda et al., the Examiner has argued that "it follows that the [claimed] strain hardening phenomenon would also occur" based upon the process disclosed in Ikeda et al. in light of the average particle size of the inert inorganic filler utilized therein. Given the Examiner's line of reasoning, it would seem that the Examiner is attempting to state that the process disclosed in Ikeda et al. inherently permits one to control the strain hardening properties of a polymer film.

With regard to the Examiner's contention that control over the strain hardening of a polymer would naturally result from the process disclosed in Ikeda et al., the Examiner's attention is directed to §2112 of the MPEP. As stated in § 2112, the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic (*citing* In re Rijckaert, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993)). To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Furthermore, it is well settled that "[i]nherency . . . may not be established by probabilities or possibilities. There mere fact that a certain thing may result from a given set of circumstances is not sufficient." In re Robertson, 49 USPQ2d 1949, 1950–51 (Fed. Cir. 1999).

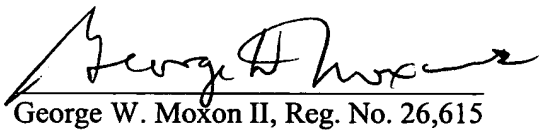
Given that the disclosure contained in Qian et al. confirms that the inclusion of nanoparticles does not always lead to an improvement in the ability to control the strain hardening characteristics of a polymer composition, one of ordinary skill in the art would, upon

reading and understanding Ikeda et al., not have viewed the process of Ikeda et al. as enabling, suggesting, and/or teaching the ability to control the strain hardening characteristics of a polymeric composition. Accordingly, Ikeda et al. fails to teach or suggest the process of the present invention.

For the foregoing reasons, reconsideration of the objection to claims 11, 16, 17 and 18, and reconsideration of the rejections under 35 U.S.C. §§ 102 and 103 are respectfully requested. Therefore, early allowance of claims 11 through 20 is respectfully requested.

Should the Examiner wish to discuss any of the foregoing in more detail, the undersigned attorney would welcome a telephone call.

Respectfully submitted,



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